

DP-309,996

Claims

1. An engine knock sensor, comprising:
 - a sleeve;
 - a threaded end established by the sleeve;
 - a transducer disposed around the sleeve;
 - a load washer disposed around the sleeve adjacent to the transducer;
 - a nut threaded onto the sleeve, the nut providing a compressive force on the load washer;
 - a seal groove formed in the sleeve; and
 - a ring-shaped seal disposed in the seal groove, the ring-shaped seal preventing liquid from entering the knock sensor.
2. The engine knock sensor of Claim 1, further comprising:
 - a base established by the sleeve opposite the threaded end of the sleeve; and
 - wherein the seal groove is formed in the base.
3. The engine knock sensor of Claim 2, further comprising:
 - a lower terminal disposed around the sleeve beneath the transducer; and

DP-309,996

an upper terminal disposed around the sleeve above the transducer.

4. The engine knock sensor of Claim 3, further comprising:
a lower insulator disposed around the sleeve beneath the lower terminal; and

an upper insulator disposed around the sleeve above the upper terminal.

5. The engine knock sensor of Claim 4, further comprising:
a housing surrounding the sleeve, the transducer, the terminals, the insulators, the nut, and the ring-shaped seal.

6. The engine knock sensor of Claim 5, wherein the ring-shaped seal is an O-ring.

7. An engine control system, comprising:
at least one microprocessor;
at least one ignition system electrically connected to the microprocessor; and

DP-309,996

at least one knock sensor electrically connected to the microprocessor, the knock sensor being sealed by a ring-shaped seal.

8. The system of Claim 7, wherein the knock sensor comprises:

a sleeve;

a threaded end established by the sleeve;

a transducer disposed around the sleeve;

a load washer disposed around the sleeve adjacent to the transducer;

a nut threaded onto the sleeve, the nut providing a compressive force on the load washer;

a seal groove formed in the sleeve, the ring-shaped seal being disposed in the seal groove, the ring-shaped seal preventing liquid from entering the knock sensor.

9. The system of Claim 8, wherein the knock sensor further comprises:

a base established by the sleeve opposite the threaded end of the sleeve; and

wherein the seal groove is formed in the base.

10. The system of Claim 9, wherein the knock sensor further comprises:

a lower terminal disposed around the sleeve beneath the transducer; and

an upper terminal disposed around the sleeve above the transducer.

11. The system Claim 10, wherein the knock sensor further comprises:

a lower insulator disposed around the sleeve beneath the lower terminal; and

an upper insulator disposed around the sleeve above the upper terminal.

12. The system of Claim 11, wherein the knock sensor further comprises:

a housing surrounding the sleeve, the transducer, the terminals, the insulators, the nut, and the ring-shaped seal.

13. The system of Claim 12, wherein the ring-shaped seal is an O-ring.

14. A method for making an engine knock sensor, comprising:
 - providing a sleeve having a base and a threaded end opposite the base;
 - forming a seal groove around the base;
 - installing a ring-shaped seal in the seal groove;
 - disposing a transducer around the sleeve above the ring-shaped seal;
 - disposing a load washer on the sleeve above the transducer;
 - and
 - installing a threaded nut on the threaded end of the sleeve.
15. The method of Claim 14, further comprising:
 - disposing a lower terminal around the sleeve beneath the transducer; and
 - disposing an upper terminal around the sleeve above the transducer.
16. The method of Claim 15, further comprising:
 - disposing a lower insulator around the sleeve beneath the lower terminal; and

DP-309,996

disposing an upper insulator around the sleeve above the upper terminal.

17. The method of Claim 16, further comprising the act of:
molding a housing around the sleeve, the transducer, the terminals, the insulators, the nut, and the ring-shaped seal.

18. The method of Claim 17, wherein the ring-shaped seal is an O-ring.

19. An engine knock sensor, comprising:
a transducer;
a sleeve supporting the transducer;
a plastic housing over molded on the sleeve to protect the transducer;
wherein one and only one continuous flat interface defining a single plane is between the sleeve and the housing.

20. The engine knock sensor of Claim 19, further comprising:
a seal groove formed in the sleeve above the continuous flat interface.

DP-309,996

21. The engine knock sensor of Claim 20, further comprising:
a ring-shaped seal disposed in the seal groove, the ring-shaped seal preventing liquid from entering the knock sensor.
22. The engine knock sensor of Claim 21, wherein the ring-shaped seal is an O-ring.